

Assignment 1

Following things to be added in each question:

- Program
- Flow chart
- Output

Submission Date: 18/09/2025

1. Armstrong Number

Problem: Write a Java program to check if a given number is an Armstrong number.

Test Cases:

Input: 153

Output: true

Input: 123

Output: false

2. Prime Number

Problem: Write a Java program to check if a given number is prime.

Test Cases:

Input: 29

Output: true

Input: 15

Output: false

3. Factorial

Problem: Write a Java program to compute the factorial of a given number.

Test Cases:

Input: 5

Output: 120

Input: 0

Output: 1

4. Fibonacci Series

Problem: Write a Java program to print the first n numbers in the Fibonacci series.

Test Cases:

Input: n = 5

Output: [0, 1, 1, 2, 3]

Input: n = 8

Output: [0, 1, 1, 2, 3, 5, 8, 13]

5. Find GCD

Problem: Write a Java program to find the Greatest Common Divisor (GCD) of two numbers.

Test Cases:

Input: a = 54, b = 24

Output: 6

Input: a = 17, b = 13

Output: 1

6. Find Square Root

Problem: Write a Java program to find the square root of a given number (using integer approximation).

Test Cases:

Input: x = 16

Output: 4

Input: x = 27

Output: 5

7. Find Repeated Characters in a String

Problem: Write a Java program to find all repeated characters in a string.

Test Cases:

Input: "programming"

Output: ['r', 'g', 'm']

Input: "hello"

Output: ['l']

8. First Non-Repeated Character

Problem: Write a Java program to find the first non-repeated character in a string.

Test Cases:

Input: "stress"

Output: 't'

Input: "aabbcc"

Output: null

9. Integer Palindrome

Problem: Write a Java program to check if a given integer is a palindrome.

Test Cases:

Input: 121

Output: true

Input: -121

Output: false

10. Leap Year

Problem: Write a Java program to check if a given year is a leap year.

Test Cases:

Input: 2020

Output: true

Input: 1900

Output: false

11. Write a Java program to add, update, remove, and display elements using LinkedList.

Testcase:

Input: ADD A

ADD B

ADD C

REMOVE 0

DISPLAY

Output: [B, C]

Input: ADD A

ADD B

ADD C

UPDATE 1 X

DISPLAY

Output: [A, X, C]

12. Write a Java program to add, search, remove, and display elements using HashSet.

Testcase:

Input: Add duplicates ignored

```
ADD A
ADD A
ADD B
DISPLAY
```

Output: [A, B]

Input: Search present vs absent

```
ADD A
ADD B
SEARCH A
SEARCH C
```

Output: true
False

13. Write a Java program to insert, delete, and display employee names in sorted order using TreeSet.

TestCases:

Input: Basic insert, sorted display, and delete

```
INSERT Zara
INSERT Aman
INSERT Neha
DISPLAY
DELETE Neha
DISPLAY
```

Output: [Aman, Neha, Zara]
true
[Aman, Zara]

Input: Duplicates ignored & case sensitivity

```
INSERT Meera
INSERT meera
INSERT Arjun
INSERT Arjun
DISPLAY
DELETE Rahul
DELETE Meera
DISPLAY
```

Output: [Arjun, Meera, meera]

```
false
true
[Arjun, meera]
```

14. Write a Java program to add, update, remove, and display books using HashMap.

TestCases:

Input: Basic add & sorted display

```
ADD 205 Refactoring
ADD 101 Clean_Code
ADD 150 Effective_Java
DISPLAY
```

Output: {101=Clean_Code, 150=Effective_Java, 205=Refactoring}

Input: Update, remove, and verify

```
ADD 1 Alpha
ADD 2 Beta
UPDATE 2 Beta_2nd_Ed
REMOVE 1
DISPLAY
```

Output: true

true

{2=Beta_2nd_Ed}

15. Write a Java program to add, update, remove, and display login details using LinkedHashMap.

TestCases:

Input: Add, update, display (insertion order preserved)

ADD alice a1

ADD bob b1

UPDATE alice a2

DISPLAY

Output: true

{alice=a2, bob=b1}

Input: Remove, re-add (reinserted at end)

ADD alice a1

ADD bob b1

ADD carol c1

REMOVE bob

ADD bob b2

DISPLAY

Output: true

{alice=a1, carol=c1, bob=b2}